the expansion behaviour of an inactive region (8, 9) which are electrode free, adjoins the active region (10) up to the inactive head region (8) and up to the inactive foot region (9), respectively.

5 2.   Piezoceramic multilayer actuator according to Claim 1, **characterised in that** in the transition region (11) between the active region (10) and the inactive head region (8) and the inactive foot region (9), the electrode-to-electrode spacing

10   (12, 13, 14, 15, 16, 17) between the inner electrodes (3) increases up to the head region (8) or foot region (9) of the actuator (1).

3.   Piezoceramic multilayer actuator according to Claim 1 or 2, **characterised in that** the increase

15   in the spacing (12, 13, 14, 15, 16, 17) of the inner electrodes (3) in the transition region (11) up to the head region (8) or foot region (9) of the actuator (1), starting from the spacing (12) of the inner electrodes (3) in the active region

20   (10), is effected stepwise in a sequence of natural number.

4.   Piezoceramic multilayer actuator according to Claim 1 or 2, **characterised in that** the increase in the spacing of the inner electrodes (3) in the

25   transition region (11) up to the head region (8) or the foot region (9) of the actuator (1), starting from the spacing (12) of the inner electrodes (3) in the active region (10), is effected stepwise in a geometric progression.

30 5.   Piezoceramic multilayer actuator according to Claim 1 or 2, **characterised in that** the increase in the spacing of the inner electrodes (3) in the transition region (11) up to the head region (8)

or the foot region (9) of the actuator (1),
starting from the spacing (12) of the inner
electrodes (3) in the active region (10), is
effected stepwise according to a logarithmic

5   scale.

6.   Piezoceramic multilayer actuator according to one
        of Claims 1 to 5, **characterised in that** the number
        of steps for increasing the spacing (12, 13, 14,
        15, 16, 17) between the electrodes (3) is matched

10   to the difference of the shrinkage and expansion
        behaviour between the active region (10) and the
        adjacent passive region (8, 9).

7.   Piezoceramic multilayer actuator according to one
        of Claims 1 to 5, **characterised in that** the

15   maximum spacing (17) between the last two
        electrodes (3) in the transition region (11) is up
        to 2 mm.

8.   Piezoceramic multilayer actuator according to
        Claim 6, **characterised in that** the maximum spacing

20   (17) between the last two electrodes (3) in the
        transition region (11) lies approximately between
        0.1 mm and 1 mm.

9.   Piezoceramic multilayer actuator according to
        Claim 1, **characterised in that** the respective

25   transition region (18) between the inactive head
        region (8) and the inactive foot region (9)
        consists of a modified piezoceramic material,
        whose shrinkage and whose expansion behaviour lies
        within the shrinkage and the expansion behaviour

30   of the active region (10).

10.   Piezoceramic multilayer actuator according to
        Claim 9, **characterised in that** the properties of

the material in the transition region (11), in particular its sintering behaviour, can be influenced by doping with impurity atoms of the materials of the inner electrodes (3).

5   11.   Piezoceramic multilayer actuator according to Claim 10, **characterised in that** the doping of the material in the transition region (11) exists in a concentration that is produced by natural diffusion in the active region (10) at the

10   boundary between an inner electrode (3) and the ceramic material (2).

12.   Piezoceramic multilayer actuator according to Claim 10 or 11, **characterised in that** the doping of the material in the transition region (11) is

15   effected with silver.